FIG. 1

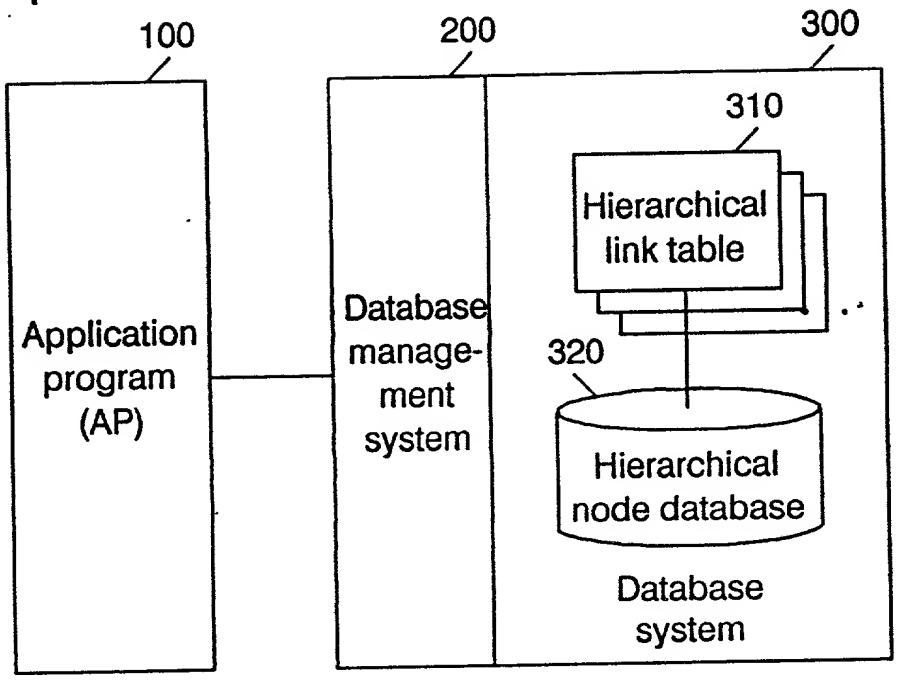


FIG. 2

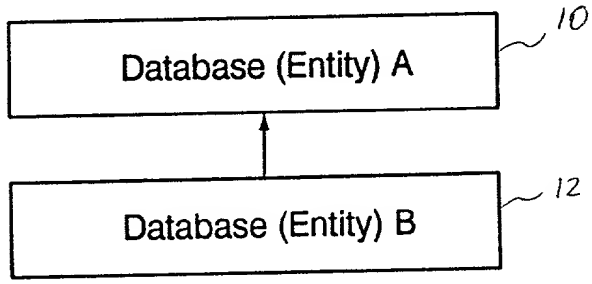


FIG. 3

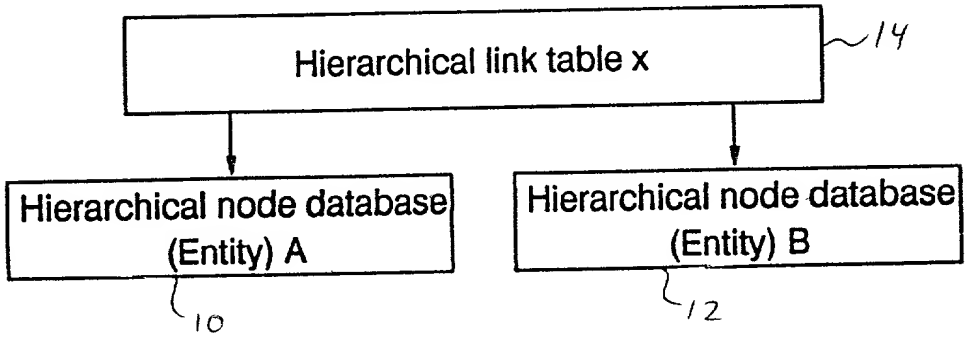
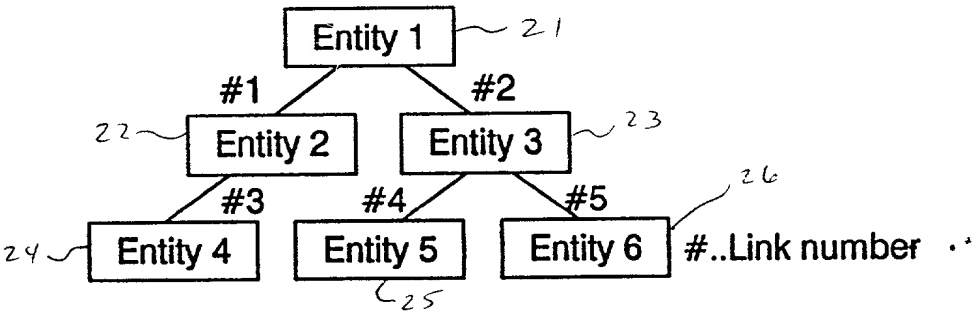
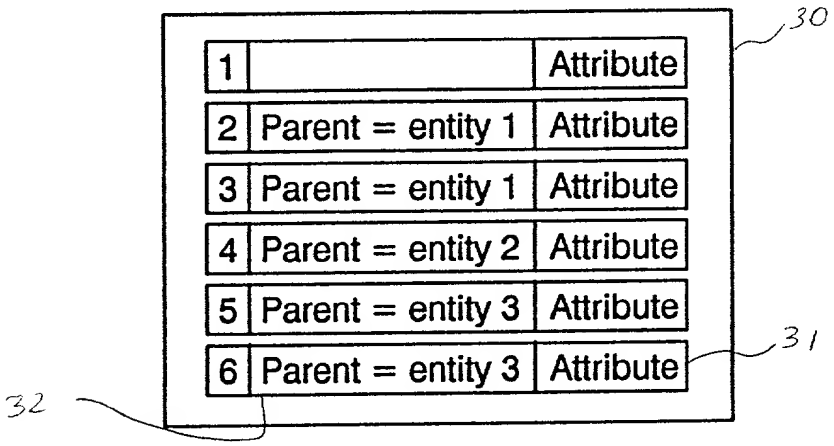


FIG. 4

Database relationship viewed from a specific application program



Conventional data storage method



Data storage method using hierarchical link table

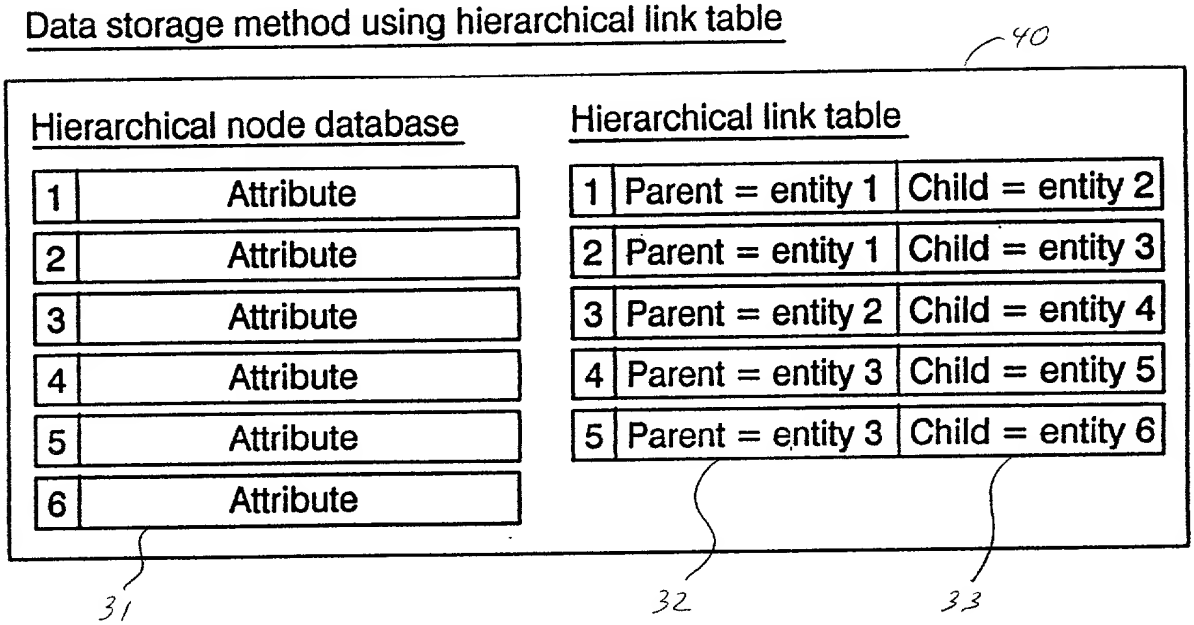
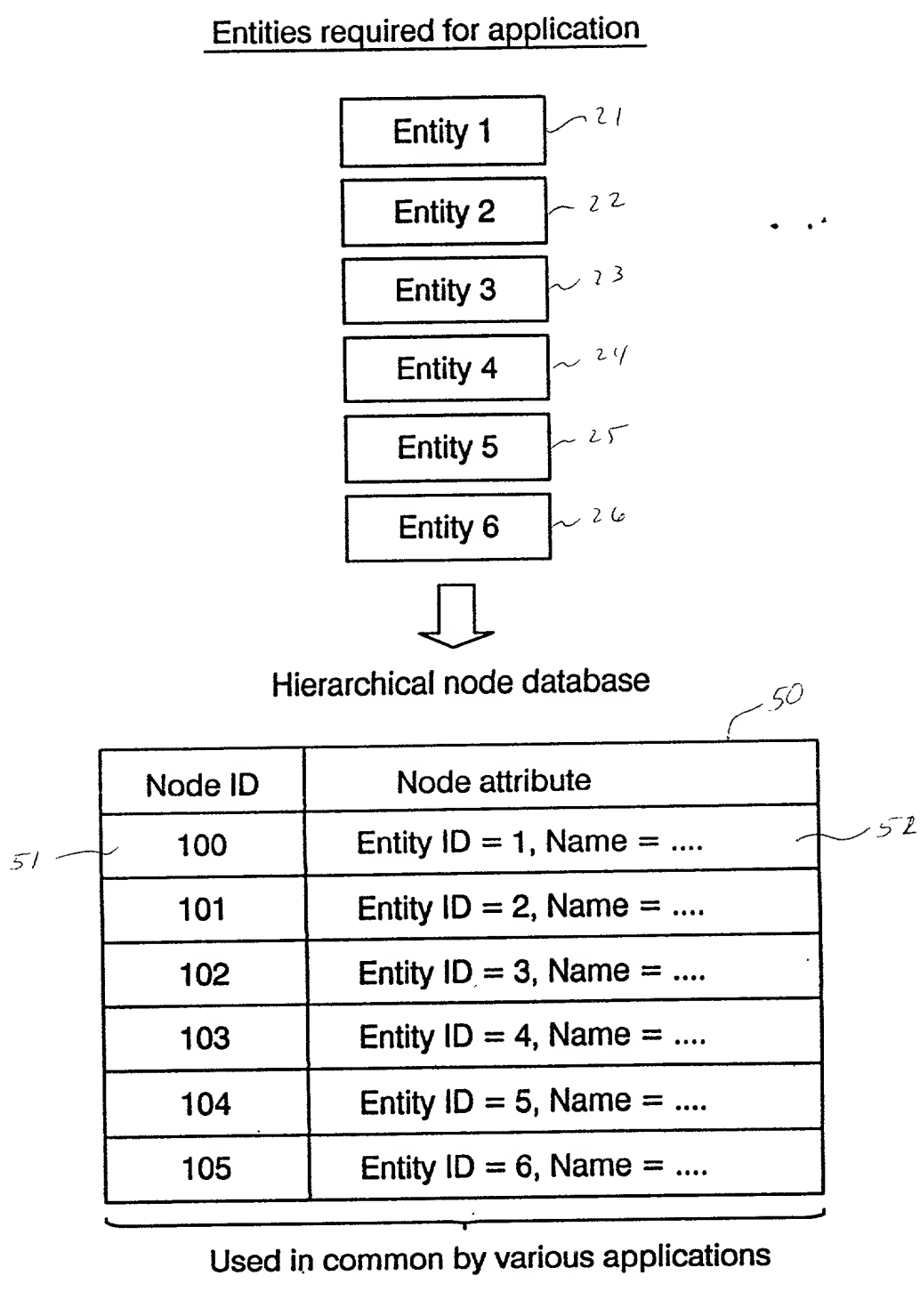


FIG. 5


Entities required for application
Entity 1
21
Entity 2
22
Entity 3
23
Entity 4
24
Entity 5
25
Entity 6
26
Hierarchical node database
50
Node ID
Node attribute
51
100
Entity ID = 1, Name = ...
52
101
Entity ID = 2, Name = ...
102
Entity ID = 3, Name = ...
103
Entity ID = 4, Name = ...
104
Entity ID = 5, Name = ...
105
Entity ID = 6, Name = ...
Used in common by various applications

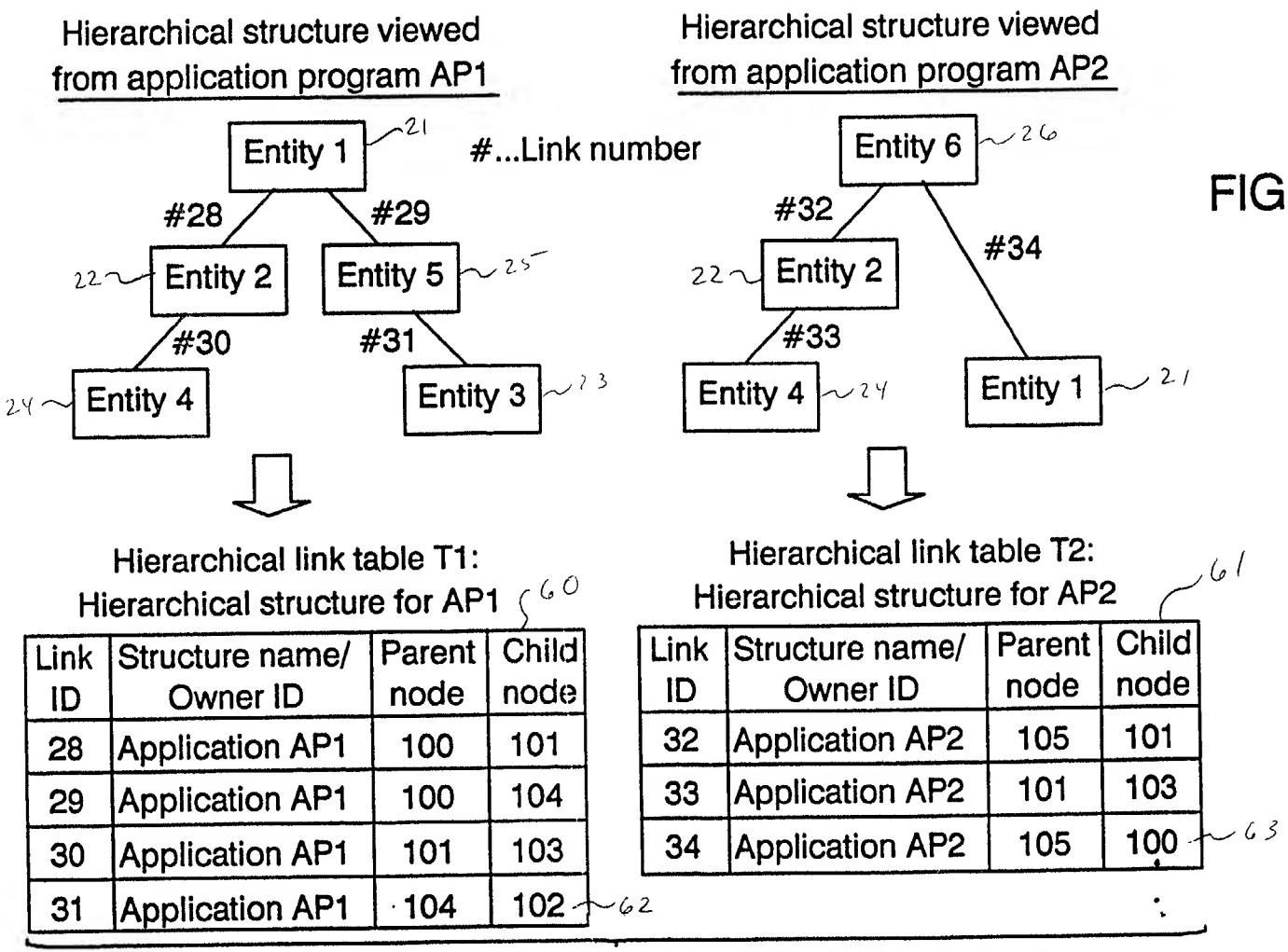

Hierarchical structure viewed from application program AP1
Entity 1
21
#...Link number
#28
#29
22
Entity 2
Entity 5
25
#30
#31
24
Entity 4
Entity 3
23
Hierarchical structure viewed from application program AP2
Entity 6
26
#32
#34
22
Entity 2
#33
Entity 4
24
Entity 1
21
Hierarchical link table T1:
Hierarchical structure for AP1
60
Hierarchical link table T2:
Hierarchical structure for AP2
61
Link ID
Structure name/ Owner ID
Parent node
Child node
28 Application AP1 100 101
29 Application AP1 100 104
30 Application AP1 101 103
31 Application AP1 104 102
62
32 Application AP2 105 101
33 Application AP2 101 103
34 Application AP2 105 100
63
Prepared in accordance with various application programs
(Can be used in common)

FIG. 6

FIG. 7

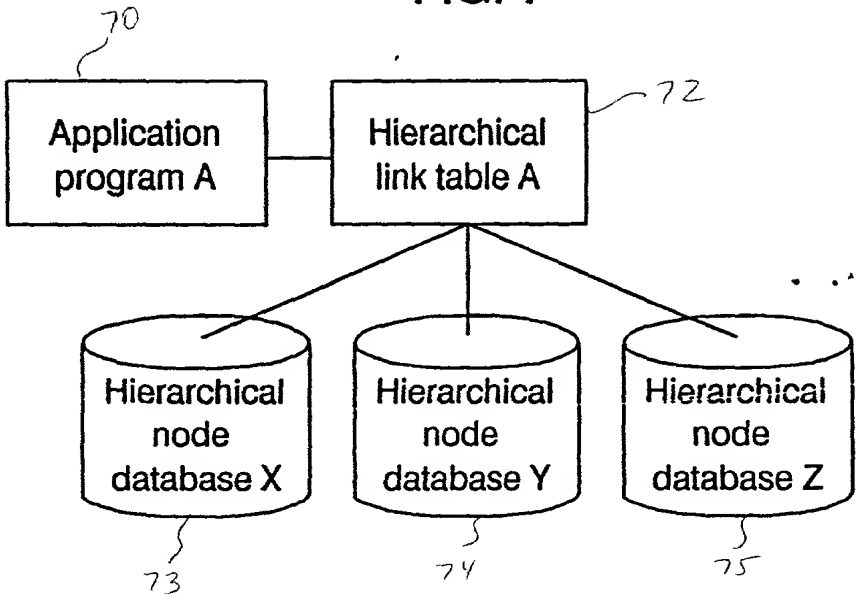
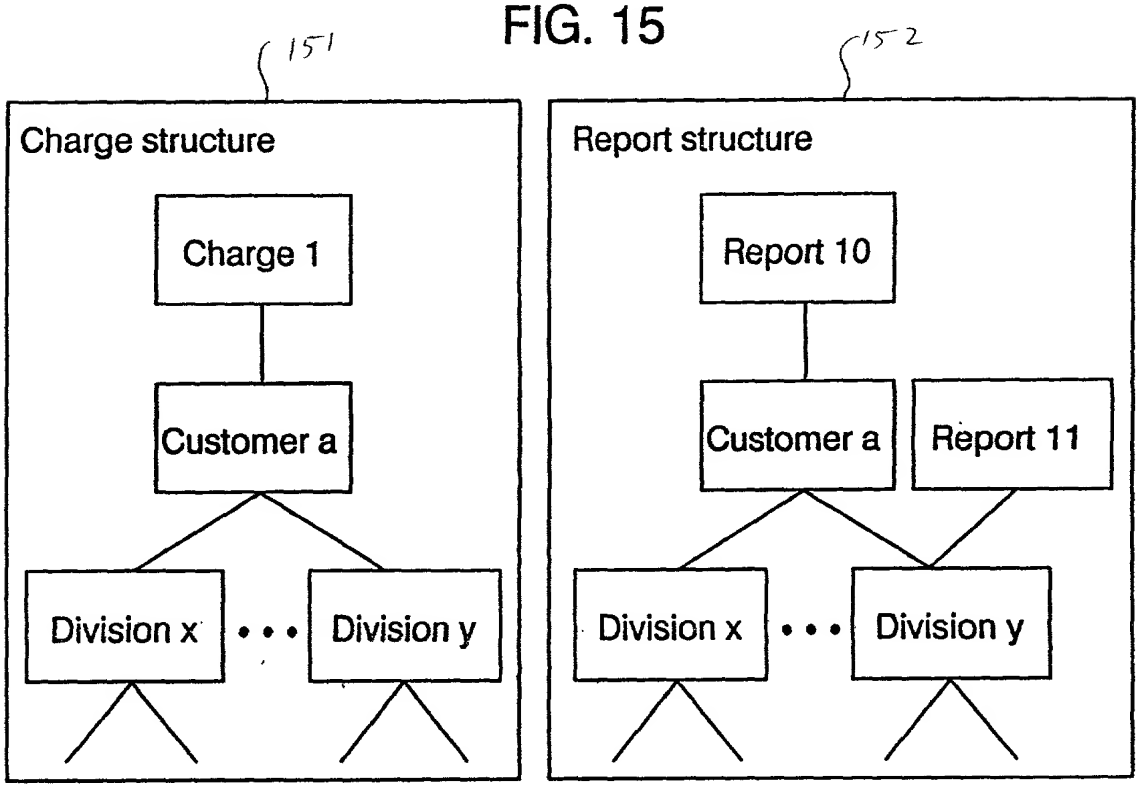

70
Application program A
Hierarchical link table A
72
Hierarchical node database X
Hierarchical node database Y
Hierarchical node database Z
73
74
75

FIG. 15


151
Charge structure
Charge 1
Customer a
Division x
Division y
152
Report structure
Report 10
Customer a
Report 11
Division x
Division y

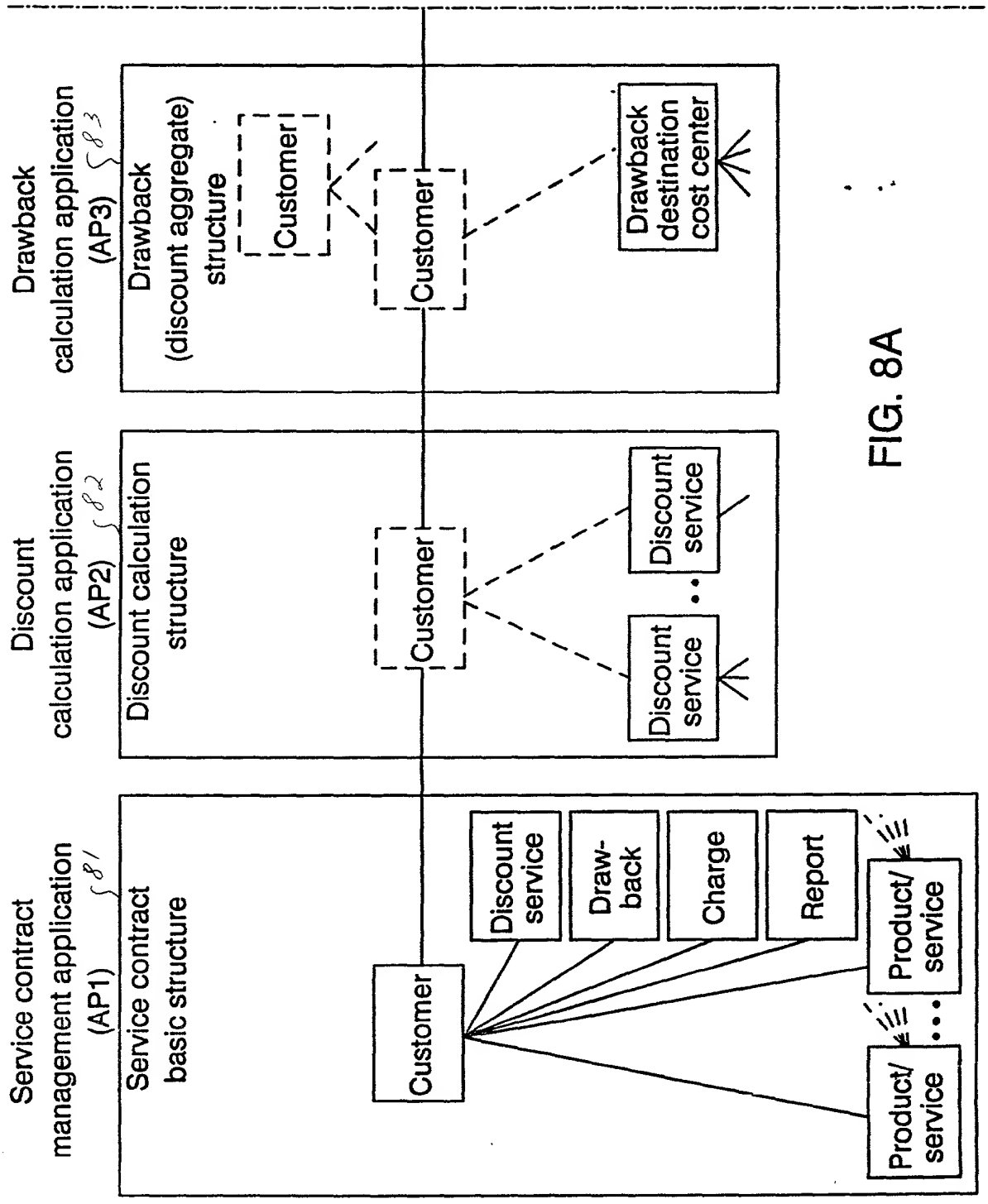

Service contract management application (AP1)
Service contract basic structure
Customer
Discount service
Draw-back
Charge
Report
Product/ service
Product/ service
Discount calculation application (AP2)
Discount calculation structure
Customer
Discount service
Discount service
Drawback calculation application (AP3)
Drawback (discount aggregate) structure
Customer
Customer
Drawback destination cost center

FIG. 8A

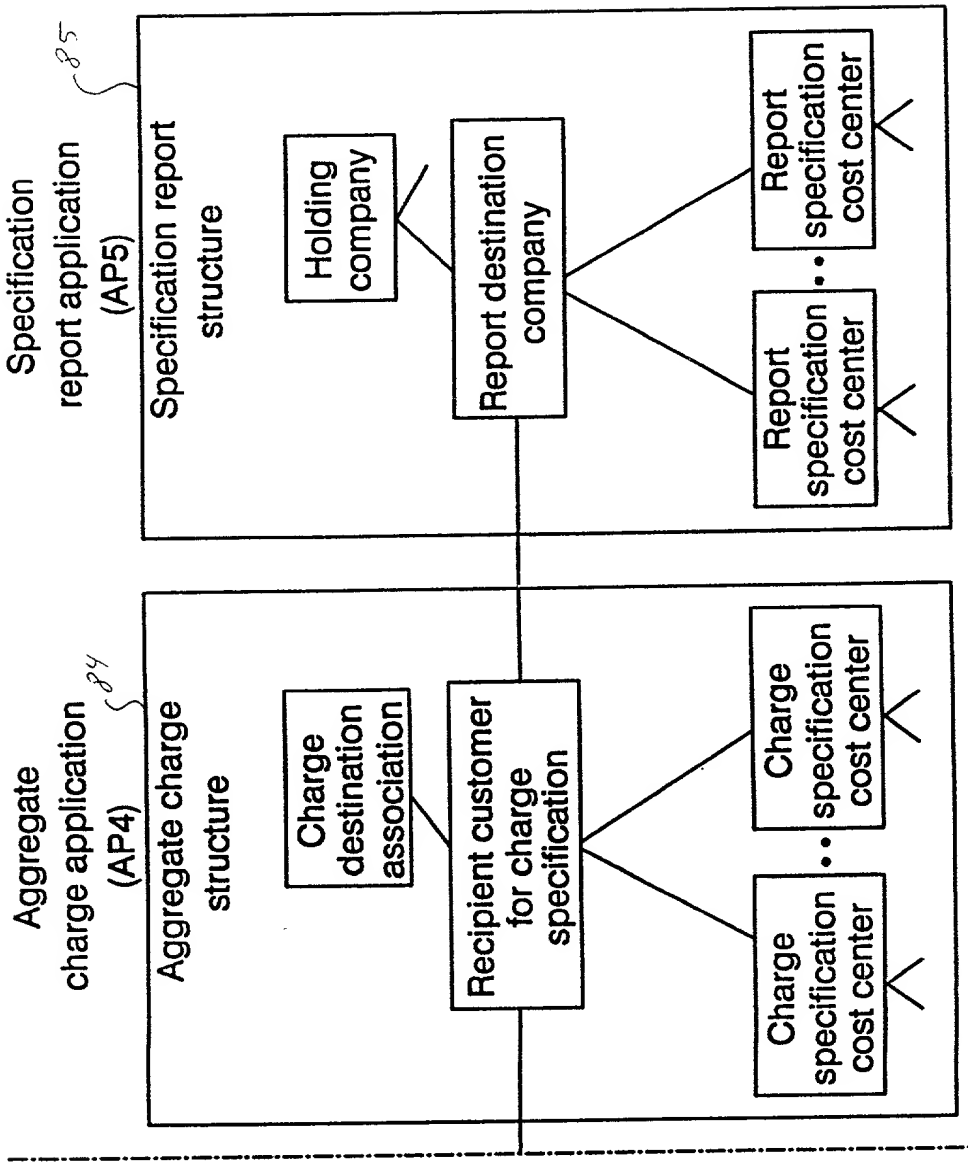
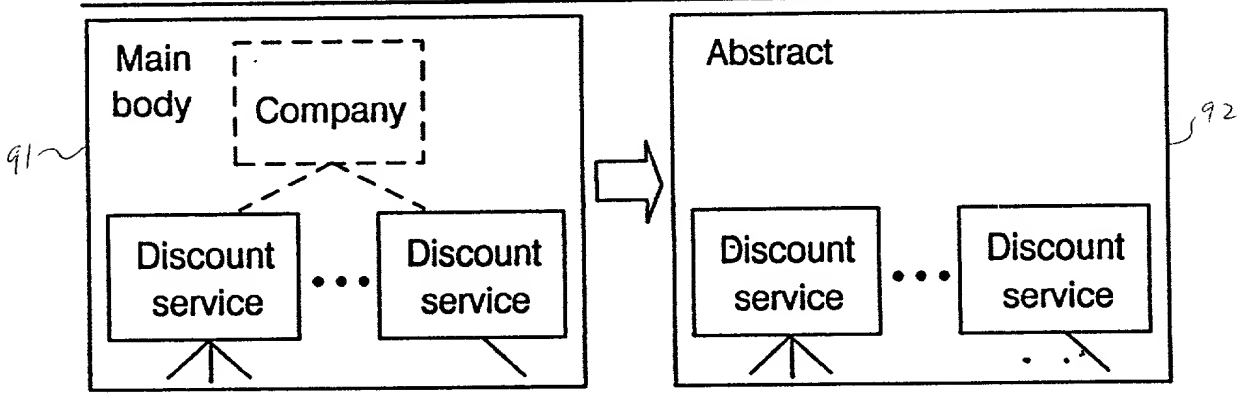


FIG. 8B

FIG. 8 FIG. 8A FIG. 8B

FIG. 9

Discount calculation structure for a specific client



Hierarchical node database: Product catalog

93

Product ID	Attribute
Product/service 1	Attribute 1
Product/service 2	Attribute 2
Product/service 3	Attribute 3
Product/service 4	Attribute 4
Charge calculation 4	Attribute 4
Discount 5	Attribute 5
Discount 6	Attribute 6

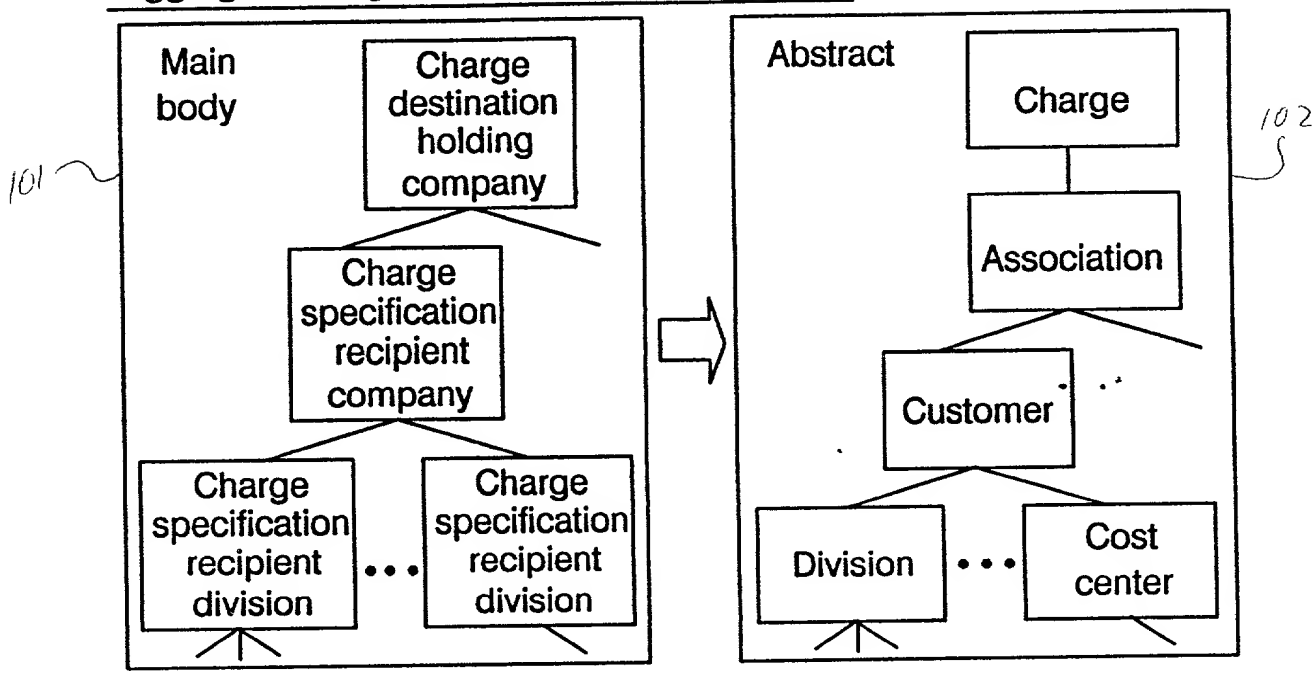
94

Hierarchical link table: Discount structure 1

Link ID	Owner	Parent node	Child node
Link 1	Discount structure 1	Charge calculation 4	Product/service 1
Link 2	Discount structure 1	Charge calculation 4	Product/service 2
Link 3	Discount structure 1	Charge calculation 4	Product/service 4
Link 4	Discount structure 1	Charge calculation 4	Product/service 3
Link 6	Discount structure 1	Discount 5	Product/service 1
Link 7	Discount structure 1	Discount 5	Product/service 2
Link 8	Discount structure 1	Discount 6	Product/service 1
Link 9	Discount structure 1	Discount 6	Product/service 3
Link 10	Discount structure 1	Discount 6	Product/service 4

FIG. 10

Aggregate charge structure for a specific client



Hierarchical node database: Organization DB

103

Organization ID	Attribute
Association 1	Attribute 1
Customer 1	Attribute 1
Division 1	Attribute 1
Division 2	Attribute 2

Hierarchical node database: Product catalog

93

Product ID	Attribute
Charge 1	Attribute 1
Product/service 1	Attribute 1
Product/service 2	Attribute 2
Product/service 3	Attribute 3
Product/service 4	Attribute 4

94

Hierarchical link table: Charge structure 1

Link ID	Owner	Parent node	Child node
Link 1	Discount structure 1	Charge 1	Association 1
Link 2	Discount structure 1	Association 1	Customer 1
Link 3	Discount structure 1	Customer 1	Cost center 1
Link 4	Discount structure 1	Customer 1	Cost center 2
Link 5	Discount structure 1	Association 1	Customer 2

Example used for hierarchical link table: 111

Link ID	Effective start date	Effective end date	Structure name/ Owner ID	Parent node	Child node
28	1999.1.10		Application AP1	100	101
29	1999.1.10		Application AP1	100	104
30	1999.1.10	1999.3.31	Application AP1	101	103
31	1999.4.1		Application AP1	101	102

Link ID	Effective start date	Effective end date	Structure name/ Owner ID	Parent node	Child node
32	1999.1.10		Application AP2	105	101
33	1999.1.10	1999.3.31	Application AP2	101	103
34	1999.1.10		Application AP2	105	100

Example used for hierarchical node database: 112

Node ID	Effective start date	Effective end date	Node attribute
100	1999.1.1		Entity ID = 1, Name = ...
101	1999.1.1		Entity ID = 2, Name = ...
102	1999.4.1		Entity ID = 3, Name = ...
103	1999.1.1	1999.3.31	Entity ID = 4, Name = ...
104	1999.1.1		Entity ID = 5, Name = ...
105	1999.1.1		Entity ID = 6, Name = ...

FIG. 11

FIG. 12 | FIG. 12 A | FIG. 12 B

FIG. 12A

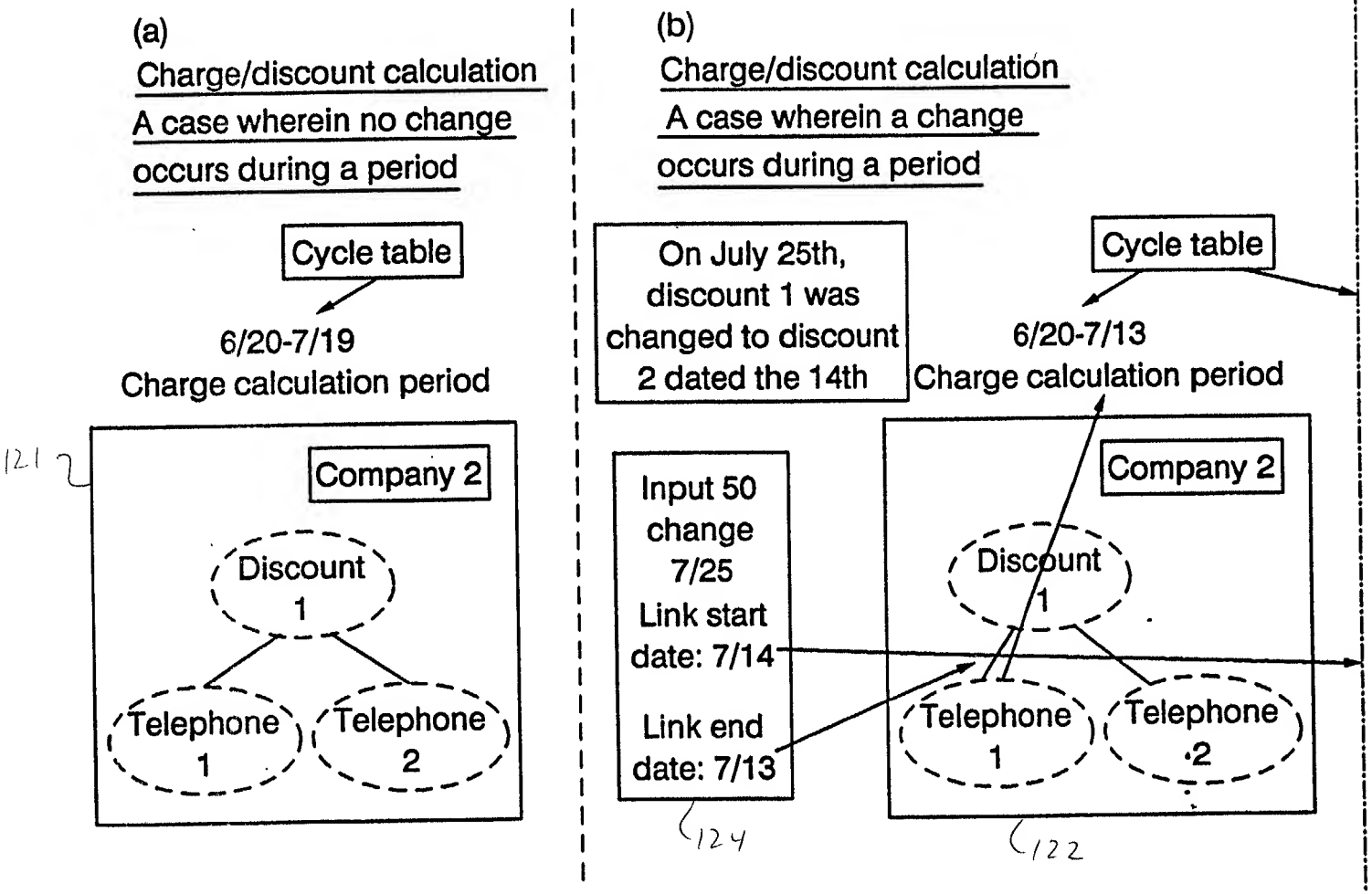
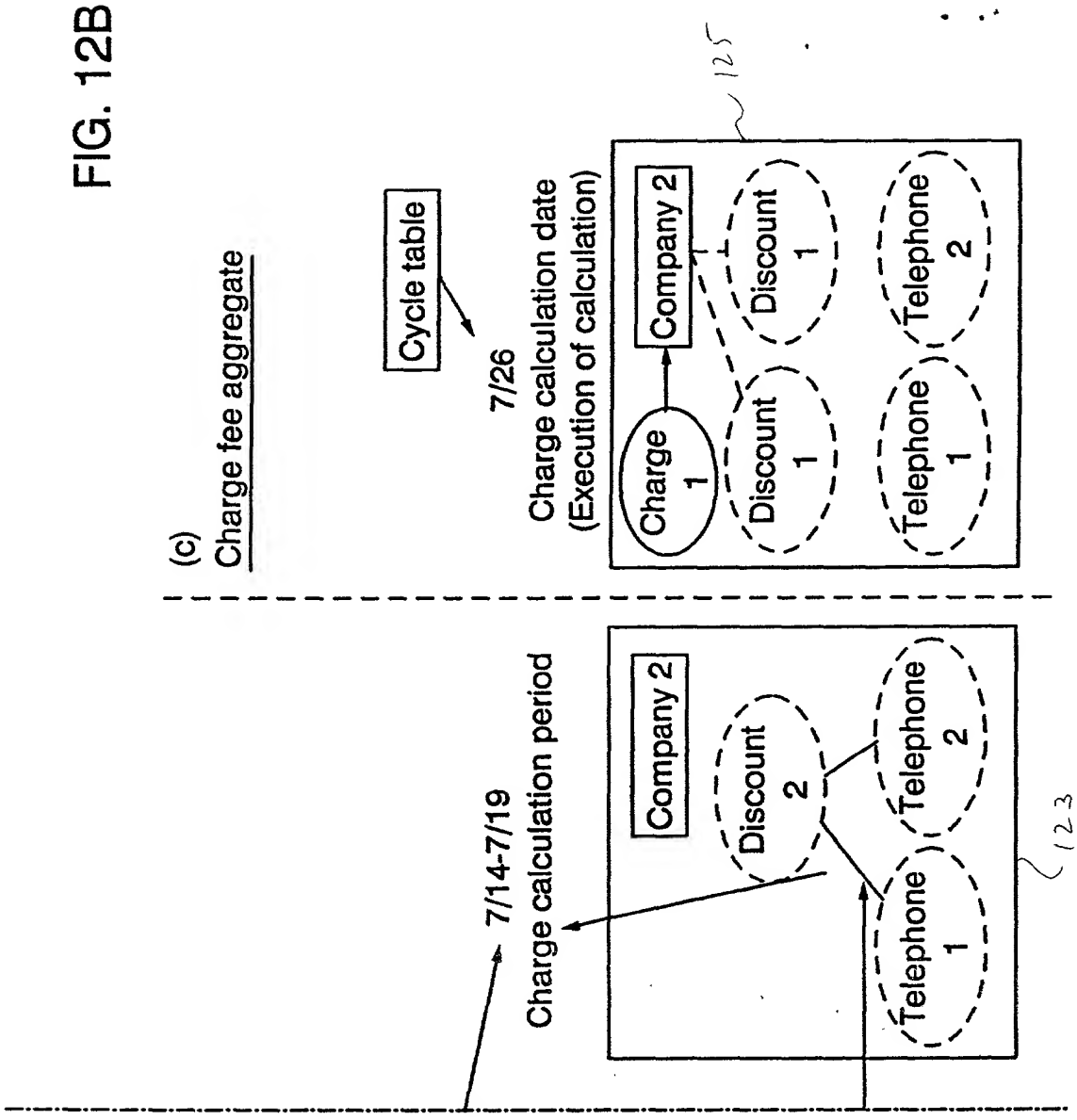


FIG. 12B


(c)
Charge fee aggregate
Cycle table
7/26
Charge calculation date
(Execution of calculation)
Charge 1
Company 2
Discount 1
Discount 1
Telephone 1
Telephone 2
125
7/14-7/19
Charge calculation period
Company 2
Discount 2
Telephone 1
Telephone 2
123

131

FIG. 13

Node ID	Effective start date	Effective end date	Node attribute
	1999.1.1	1999.3.31	Type = nearest address, Telephone address ID = ...
	1999.4.1		Type = nearest address, Telephone address ID = ...
	1999.1.1	1999.3.31	Type = cable, Cable ID =, Cable name = ...
	1999.4.1		Type = cable, Cable ID =, Cable name = ...
	1999.1.1		Type = HH, HH - ID =, HH name = ...
	1999.1.1		Type = optical center line, Optical center line No =, Status = vacant
	1999.8.1		Type = ONU. ONU type =. ONU - ID = ...
	1999.8.1		Type = ONU - LC, _C slot No = ...
	1999.1.1		Type = N - SLT, SLT - ID = ...
	1999.1.1		Type = OSU, OSU position = ...
	1999.1.1		Type = VCN, VCN position = ...
	1999.1.1		Type = connection terminal, Connection terminal No = ...
	1999.1.1		Type = metal center line, Center line No = ...
	1999.1.1		Type = LXM position, LXM position No = ...
	1999.1.1		Type = DSU, DSU - ID = ...
	1999.1.1		Type = connection terminal, Connection terminal No = ...

FIG. 14A

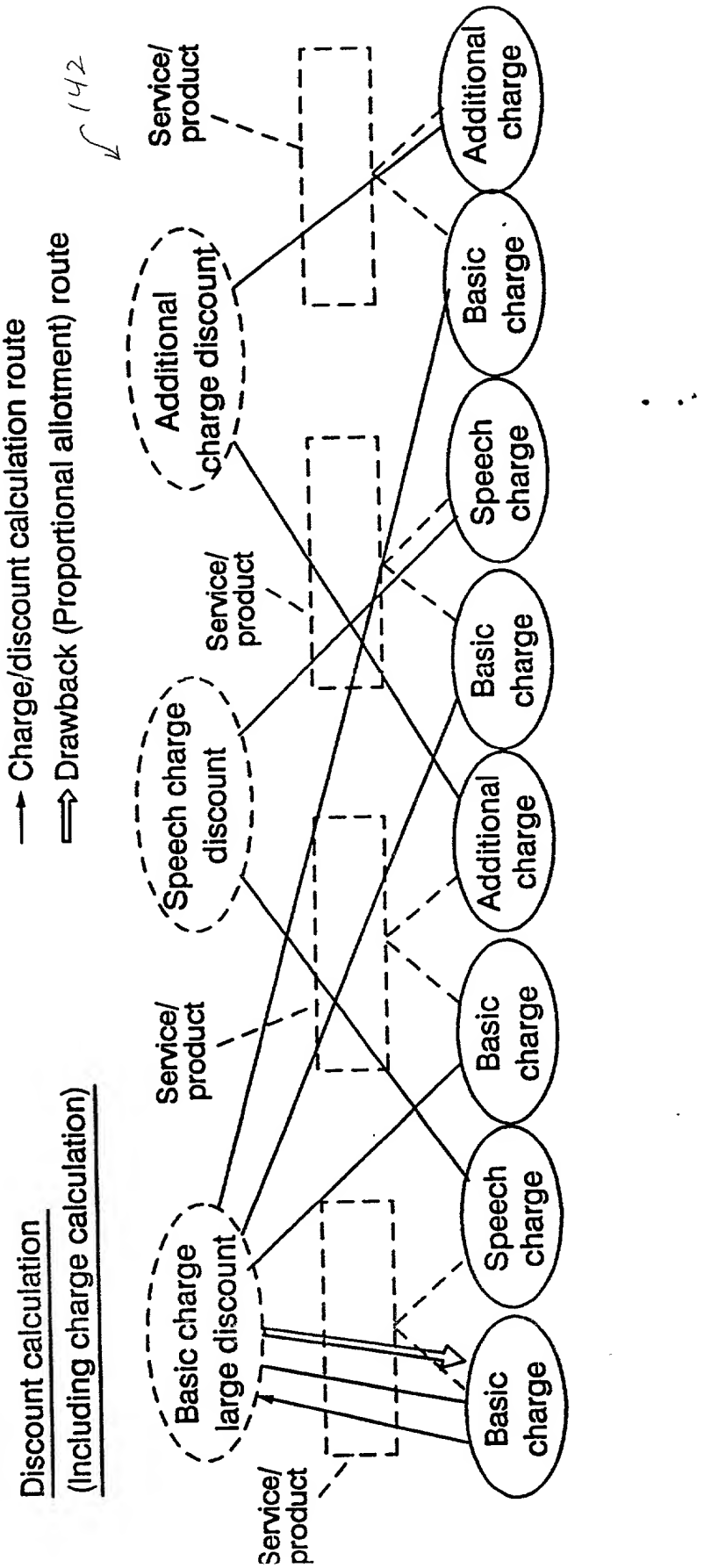
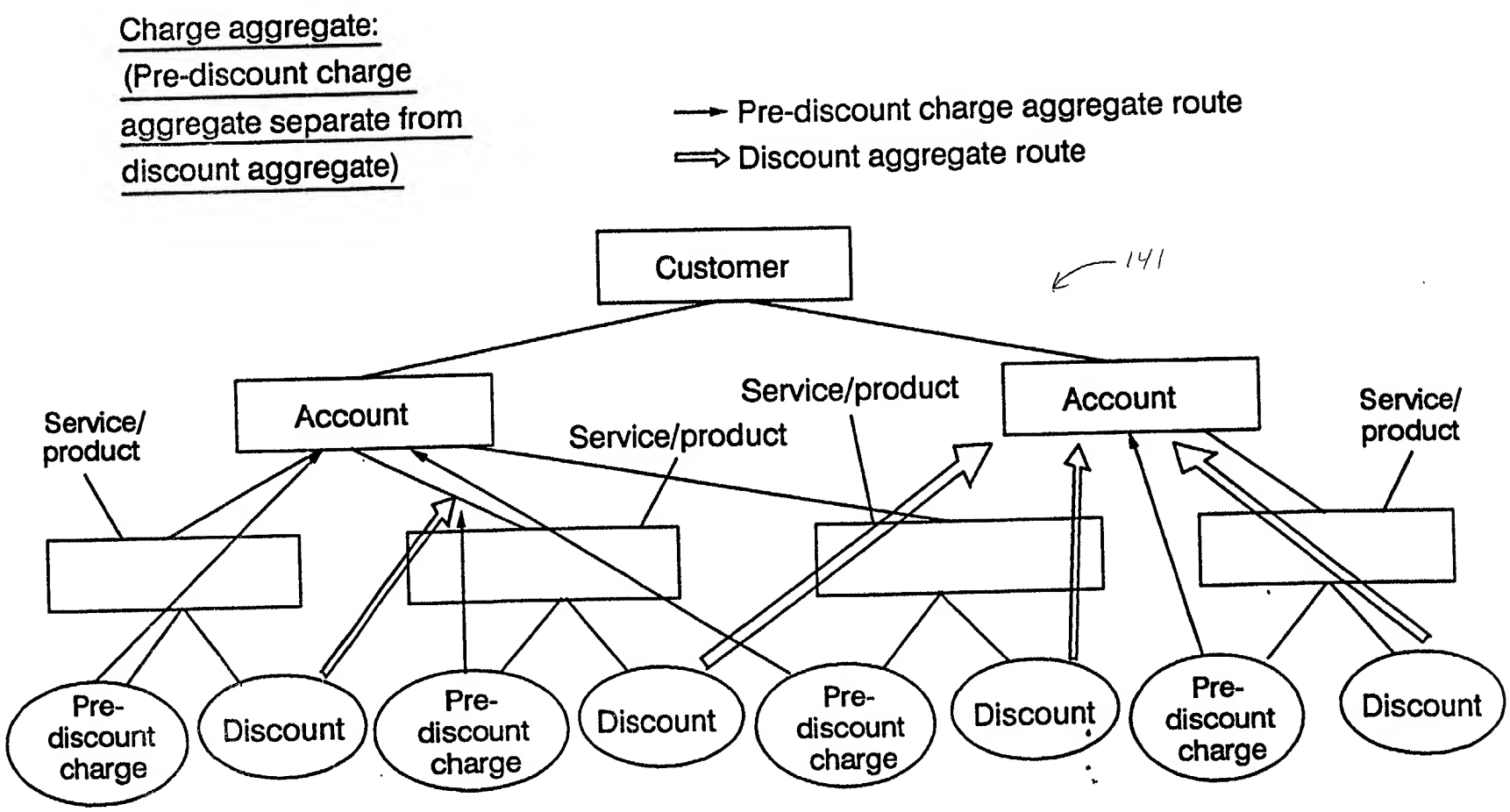

Charge/discount calculation route
Drawback (Proportional allotment) route
142
Discount calculation
(Including charge calculation)
Service/ product
Basic charge large discount
Speech charge discount
Additional charge discount
Basic charge
Speech charge
Additional charge
Basic charge
Speech charge
Additional charge
Basic charge
Service/ product
Service/ product
Service/ product

FIG. 14B


Charge aggregate:
(Pre-discount charge aggregate separate from discount aggregate)
Pre-discount charge aggregate route
Discount aggregate route
Customer
141
Account
Account
Service/product
Service/product
Service/product
Service/product
Pre-discount charge
Discount
Pre-discount charge
Discount
Pre-discount charge
Discount
Pre-discount charge
Discount